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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,307	02/26/2004	Ye-Yong Kim	IK-0072	3458

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EXAMINER	
CHANDRAN, BIJU INDIRA	
ART UNIT	**PAPER NUMBER**
2835	

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/786,307	KIM ET AL.	
	Examiner	Art Unit	
	Biju Chandran	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

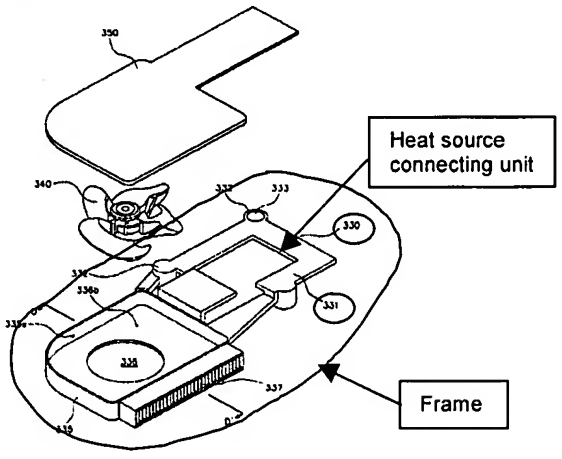
DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "dissipating unit" of claim 1, and the "transfer region" of claim 15 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

2. The drawings are objected to because the "frame" and "heat-source connecting unit" claimed in claims 1-7, and 16-21 appear to point to the same feature in Figure 9. The examiner has assumed that the entire structure shown in the lower part of figure 9 to be the frame and the part of the frame on the right side to be the heat-source connecting unit.

FIG. 9



Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: The applicant seems to refer to the apparatus as "dissipating plate" ("100" in figure 2). While the applicant is entitled to be his own lexicographer, conventional art-accepted terminology is recommended. Recommend

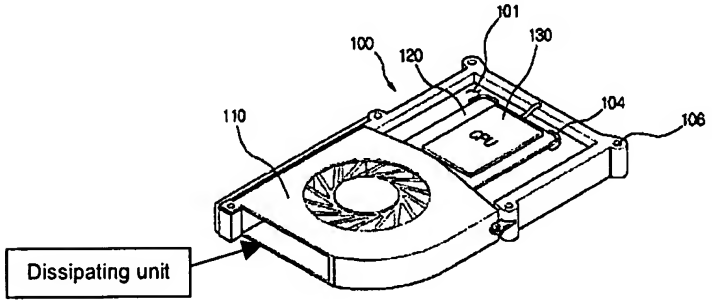
naming the apparatus "cooling device" or some such term. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-7 & 16-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to these claims, it is unclear from the specification what the applicant is referring to as the "dissipating unit". The examiner has interpreted the dissipating unit as illustrated in the figure below.



5. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to this claim, the specification and the drawings do not show guide

protuberances '104' on the outer periphery of the settle unit '102'. The guide protuberances shown are on the inside of the dissipating plate (figure 2, paragraph 35, page 8). Therefore, the examiner has interpreted the guide protuberances to be on the inside of the dissipating plate.

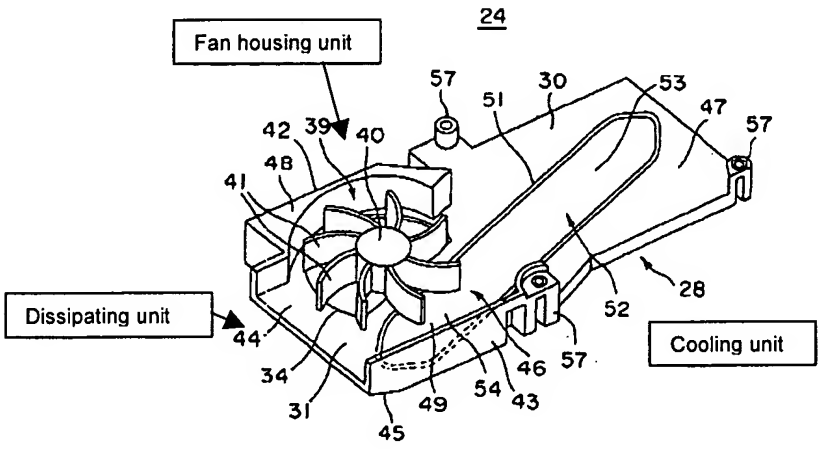
6. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to this claim, it is unclear from the specification what the applicant is referring to as the "transfer region". The examiner has disregarded this element in the claim. Also, the specification does not identify "a plurality of guides" in the liquid cooling moving block. The examiner has interpreted the said guides to couple coolant storage block and the condensation block as mentioned in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2-4, 6, 7 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Kawashima et al. (PGPub US 2002/0167799).



- Regarding claim 1, Kawashima et al. disclose a cooling system (24) for a portable computer (paragraph 0017) comprising: a frame having a heat-source connecting unit (30) in a first side and having a fan housing unit (31) in a second side; a dissipating unit (44) on one side of the fan housing unit of the frame that is configured to perform heat exchange; a dissipating fan (39) within the fan housing unit configured to form an air stream that would pass through the dissipating unit from inside the fan housing unit; and a cooling unit (52) coupled to the first side of the frame and configured to deliver heat from the heat-source connecting unit to the dissipating unit.
- With respect to claim 2, Kawashima et al. further discloses that the cooling unit is a micro cooling unit configures to perform heat

exchange using a cooling cycle caused by phase change (paragraph 0018).

- Regarding claim 3, Kawashima et al. further discloses that the cooling unit is a plate-heat pipe that covers one side of the frame.
- Regarding claim 4, Kawashima et al. further discloses that the plate heat pipe is filled with a liquid.
- With respect to claim 6, Kawashima et al. further discloses that the heat source connecting unit is configured to thermally couple to a main board, and wherein when the frame is removed a processor mounted on the main board is exposed (paragraph 0053).
- With respect to claim 7, Kawashima further discloses that the frame and the cooling unit provide two heat removing paths to the dissipating unit (paragraph 0024-0026).
- With respect to claim 21, Kawashima et al. disclose a cooling system (24) for a portable computer (paragraph 0017) comprising: a frame having a recess (51) in a first side and having a fan housing unit in a second side; a micro cooling system (52) having a first side configured with a heat releasing part coupled to the recess and a second opposite side configured to include a heat absorption part (paragraph 0050), wherein the micro cooling system is configured to perform heat exchange by repeating a cooling cycle of condensation and evaporation using a capillary phenomenon to transfer heat arising from

the processor (paragraph 0018). A dissipating unit (44) on one side of the fan housing unit of the frame that is configured to perform heat exchange (paragraph 0034); a dissipating fan with the fan housing unit configured to form an air stream that would pass through the dissipating unit from inside the fan housing unit (paragraphs 0020, 0030, 0054); and a plate-heat pipe on one side of the frame and configured to deliver heat from the frame to the dissipating unit by circulating a fluid through its inside (paragraphs 0054).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

- Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawashima et al. Kawashima et al. disclose all the limitations recited in claim 4. Kawashima et al. do not expressly disclose that the thickness of the plate-shaped cooling unit is approximately 1mm thick. If in fact the thickness of the cooling unit is not approximately 1mm, it would have been obvious to one of ordinary skill in the art, to design its thickness to be approximately 1mm, or to be of any value necessary in

order for the device to operate at maximum efficiency within the space and weight constraints (paragraph 0021, Kawashima et al.).

8. Claims 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawashima et al. in view of Malone et al. (PGPub US 2003/0016500 A1).

- With regard to claim 8, Kawashima et al. discloses a cooling system (24) for use in a portable computer (paragraph 0017) comprising a dissipating plate having a dissipating fan (39) in its one side and having a settle-down groove in its inside (51), a micro cooling system having a first side coupled to an upper surface of the groove and a second opposite side configured to face a processor, wherein the micro cooling system is configured to perform heat exchange by repeating a cooling cycle of condensation and evaporation using a capillary phenomenon to transfer heat arising from the processor. Kawashima does not disclose a settle unit between the settle-down groove and the first side of the micro cooling system. Malone et al. discloses a heat dissipation device with a settle unit (504) between the micro-cooling system (506) and the dissipating plate. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the settle unit as taught by Malone et al. in the cooling system as taught by Kawashima et al., to provide vibration

isolation for the electronic components, and fault tolerance for the cooling system (Malone et al., paragraph 0007,0009).

- With respect to claim 9, Kawashima et al. as modified by Malone et al. meets all the limitations of claim 8. Kawashima et al. further discloses that the dissipating plate is fastened to a main board inside a portable computer (paragraph 0017, 0053).
- With respect to claim 10, Kawashima et al. further discloses that the dissipating plate is configured to removably provide access to a processor mounted on the main board (paragraph 0017, 0053).
- With respect to claim 11, Kawashima et al. further discloses that the micro cooling system is thermally coupled to the processor when the dissipating plate is fastened to the main board (paragraph 0017, 0053). Kawashima et al. does not disclose the micro cooling system adjacent to the processor to be of an identical material. It would have been obvious to one of ordinary skill in the art to select any known conductive material such as the material of the processor based upon routine experimentation to determine which material would be most readily available, cost effective, and suitable for the particular application.
- With respect to claim 12, Kawashima et al. further discloses that the dissipating plate surrounds the processor (see figure) to perform radiation cooling of an enclosed space.

- With respect to claim 13, Kawashima et al. further discloses a coil spring to give elastic force to a screw joining between the dissipating plate and the main board (paragraph 0050).
- With respect to claim 14, Kawashima et al. as modified by Malone et al. meets all the limitations of this claim. Kawashima further discloses guide protuberances (walls of groove '51') on the inside of the dissipating plate. Kawashima as modified by Malone is silent as to the manner in which the settle unit and the micro-cooling system are joined. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use any known process to join the items to decrease cost and increase reliability. Even though the claims are limited by and defined by the recited process, the determination of patentability of the product is based on the product itself, and does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed Cir. 1985).

9. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawashima et al. in view of Malone et al. as applied to claim 8 above, and further in view of Shabbir et al. (US Patent 6,400,565 B1). Kawashima et al. as modified by Malone et al. meets all the limitations of claim 8. Kawashima further discloses that the micro cooling unit has a liquid

coolant storage block (53) connected to a liquid coolant condensation block (54) (paragraph 0054). Kawashima does not disclose that the micro cooling unit has a plurality of guides that couple a liquid coolant storage block to the liquid coolant condensation block. Shabbir et al. disclose a micro cooling unit (18) that has a plurality of guides (46) that couple a liquid coolant storage block (34) to the liquid coolant condensation block (48). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the plurality of guides taught by Shabbir in the micro cooling unit disclosed by Kawashima et al., to enable easier exchange liquid and vapor between evaporation region and the condensation region of the cooling unit.

10. Claims 16, and 18 - 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawashima et al. in view of Nakanishi et al. (US Patent 6,351,382 B1). Kawashima et al. disclose a cooling system (24) for a portable computer (paragraph 0017) comprising: a frame having a heat-source connecting unit in a first side and having a fan housing unit a second side; a dissipating unit on one side of the fan housing unit of the frame that is configured to perform heat exchange; a dissipating fan with the fan housing unit configured to form an air stream that would pass through the dissipating unit from inside the fan housing unit (paragraph 0034); and a plate-heat pipe (52) on one side of the frame and configured

to deliver heat from the heat-source connecting unit to the dissipating device by circulating a fluid through its inside. Kawashima et al. do not explicitly disclose a dissipating pin. Nakanishi et al. disclose dissipating pins (Figure 2, Nakanishi et al.) in the dissipating region of a cooling device for notebook computers. At the time the invention was made, it would have been obvious to one of ordinary kill in the art to incorporate dissipation pins as taught by Nakanishi et al., in the cooling system as taught by Kawashima et al. to increase area available for heat dissipation.

- With respect to claim 18, Kawashima et al. further discloses that dissipating fan assembly is installed in the space partitioned by the fan housing unit and the plate-heat pipe (see figure) and forms and air stream that collides against the plate-heat pipe and the dissipating unit (paragraph 0034).
- With respect to claim 19, Kawashima et al. further discloses that the frame is fastened to a main board in the portable computer, wherein the dissipating unit is thermally coupled to a processor in the main board, and wherein the frame and the plate-heat pipe are configured to provide access to the processor (paragraph 0017, 0053).
- Regarding claim 20, Kawashima et al. do not expressly disclose that the thickness of the plate-heat pipe is approximately 1.5mm thick. If in fact the thickness of the plate-heat pipe is not approximately 1.5mm, it would have been obvious to one of ordinary skill in the art, to design its

thickness to be approximately 1.5mm, or to be of any value necessary in order for the device to operate at maximum efficiency within the space and weight constraints (paragraph 0021, Kawashima et al.).

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawashima et al. in view of Nakanishi et al. as applied to claim 16 above, and further in view of Samaras et al. Kawashima et al. as modified by Nakanishi does not disclose that the plate heat-pipe completely shields one side of the fan-housing unit. Samaras et al. disclose a plate-heat pipe (150) that covers one side of the frame. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the plate heat pipe as taught by Samaras et al. in cooling system as taught by Kawashima et al. to efficiently spread the heat across entire face of the heat pipe so that it can be efficiently dissipated (Samaras et al., column 4, lines 6-8).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Biju Chandran whose telephone number is (571) 272-5953. The examiner can normally be reached on 8AM - 5PM. Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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